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11 November 1960

MEMORANDUM FOR : Chief, Development Branch, EPD-00/P

SUBJECT : Trip Report of Visit to Lockheed  
Aircraft Facility

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1. On 27 and 28 October 1960, [REDACTED] and [REDACTED] visited the Lockheed Burbank facility. The purpose of the visit was to discuss the preflight procedures and the proposed flight test program for the A-12.

2. Lockheed does not foresee any timing problem in the pre-flight process affecting the operational utilization of the vehicle. That portion of the preflight inspection and readiness to be accomplished by Lockheed with any necessary assist from Pratt and Whitney, will pertain to aircraft system checks and servicing except for fuel. This over-all check of the airplanes can be accomplished well ahead of any anticipated operational utilization and held in a "stand-by" condition. Such a preparation can be done as much as a day or two prior to flight although such a time delay is not desirable.

3. Although some basic thought has been given to the flight test program, no detailed study has been made. Present plans call for complete flight test instrumentation on aircraft No. 1 for stability, control, and performance testing. In addition, airplane No. 2 will have complete engine instrumentation. Airplane No. 2 has been assigned the mission of system tests of the payload, INS, autopilot, and anti-radar studies. Since the rate of progress in speed is a direct function of proven safety in test on No. 1 for use in the accelerated program, it does not seem very practical to put all of this type of work on one aircraft. [REDACTED]

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4. The flight test area has not been defined. Preliminary plans call for conducting all A2 testing over water in the area of Santa Rosa Island. Since the problem exists in maintaining the peace with the general public, this will probably mean subsonic flight to and from the test area. This creates two basic problems.

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Firstly, it means approximately 40 to 45 minutes of relatively useless flight time in each direction. This is compounded by the amount of fuel used and thus requires in-flight refueling quite early in the test program. Secondly, in order to fly a subsonic profile to the test area, the airplane will probably fly at a relatively low altitude. This could cause a serious compromise in the security of the program. The proposed test area for the other aircraft runs generally in a northerly direction from take-off. To stay within the limits of the continental U. S., this gives a straight run of only 750 nautical miles. After the 250 miles used in the normal climb, this 500 mile run will be accomplished in approximately 16 minutes. Also, this area crosses four airways including the primary commercial airway to the San Francisco area.

5. Although not firm at this time, Lockheed is proposing the use of the F-104 as the chase plane in the test program. Since the F-104 is as fast as any fighter available, it would offer good potential as a chase plane. However, no airplane in the Air Force inventory will adequately chase the A-12 in the speed regime of primary interest and concern, i.e., above Mach 2.5. Therefore, the F-101 may be a more desirable vehicle for the chase program. The F-101 offers many advantages as a training vehicle in addition to sufficing as a chase plane. Since the F-101 is a twin engine airplane, practice is afforded in twin throttle manipulation and practice of engine out conditions. The F-101 also has the boom IFR system to provide practice of this type prior to actual hook-ups in the A-12. The F-104 has the capability of providing chase to higher speeds than the F-101. Both aircraft have two seat models for utilization in a photo chase mission.

6. Discussions were held with Mr. Schalk regarding the flight simulator studies. As a general statement, it is required to have all systems operating properly for successful mission accomplishment. Loss of stability augmentation about any axis results in unsatisfactory flying characteristics. The redundancy of the SAS should prevent such a loss until such time as a satisfactory flight condition can be achieved. It is possible to land the airplane if either the Mach trim or pitch damper is operative; however, the Mach trim must be operative for successful IFR. All data thus far are based on rigid airplane parameters and theory. The flexible data inputs will be incorporated in the next series of tests scheduled for early December.

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7. A short discussion was held with [REDACTED] concerning the limited amount of flexible aircraft data. With only a very few points of data available, the trends show a relatively large destabilizing influence caused by aeroelasticity. In all cases investigated, the airplane changed from a stable condition to an unstable vehicle. While this tendency does help reduce the trim drag of the aircraft, it increases the requirements of the SAS and autopilot. The aircraft bending under a 2.5g load shows as much as 4 inches of deflection. Bending of both the nose and tail is downward under this condition. Further studies are in progress.

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